FSB (Subject-Specific Provisions)
for the Elite Master's Degree Programme in Satellite Technology in the Elite Network of Bavaria (ENB) (120 ECTS Credits)

at Julius-Maximilians-Universität Würzburg

dated 15 May 2018

(This document is available for download at XXX)

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Article 13 Subarticle 1 Sentence 2 in conjunction with Article 58 Subarticle 1 and Article 61 Subarticle 2 Sentence 1 *Bayerisches Hochschulgesetz* (Bavarian Higher Education Act, BayHSchG) dated 23 May 2006 (*Bayerisches Gesetz- und Verordnungsblatt* (Bavarian Law and Ordinance Gazette, GVBI) p. 245, *Bayerische Rechtssammlung* (Collection of Bavarian Laws, BayRS) 2210-1-1-WFK) as amended from time to time forms the framework for the following subject-specific provisions decreed by Julius-Maximilians-Universität Würzburg.

Contents

Part 1: General Provisions

Section 1 Scope

These subject-specific provisions (FSB) shall supplement the ASPO (General Academic and Examination Regulations) for the Bachelor's and Master's Degree Programmes at Julius-Maximilians-Universität Würzburg (JMU) dated 1 July 2015 as amended from time to time.

Section 2 Aims and Objectives of the Degree Programme, Learning Outcomes

(1) 1The Faculty of Mathematics and Computer Science of JMU offers the elite Satellite Technology programme (hereafter: SaTec) as a research-based course leading to the degree of 'Master of Science' (MSc) in the framework of the Elite Network of Bavaria. 2The language of instruction is exclusively English.

(2) 1In the framework of the SaTec programme in the Elite Network of Bavaria, students acquire the special knowledge and skills needed to be able to apply interdisciplinary contents from physics, computer science, geosciences, electrical engineering, mathematics, natural and engineering sciences in the field of aerospace engineering to solve complex tasks; a particular focus is small, pico and nano satellites.2The common language of aerospace research at international level is English: Subsystems, data sheets and other aerospace materials are developed and compiled in English; as a rule, international research groups and networks use English as their working language and symposia and conferences are held in English. 3In addition, a large proportion of specialist literature is exclusively available in English. 4It is highly probable that graduates will later work in an English-speaking environment, for example the common language of launch operators in satellite control centres is English. 5It is therefore imperative that graduates of the programme feel fully at home with the English language and the respective technical terminology. 6To this end, the programme is run entirely in English. 7Since aerospace engineering demands an innovative and interdisciplinary approach, the SaTec programme in the Elite Network of Bavaria brings together highly talented applicants from a heterogeneous target group and researchers from throughout the world. 8Having successfully completed the programme, graduates possess the following skills and knowledge:

- An overview of the interrelationships in the field of aerospace engineering and its areas of application;
- The ability to utilise subject-specific content and apply scientific methods and findings;
- The specialist knowledge required for the transition to professional or research practice; for example they can:
    - Analyse satellite orbits, model constraints and perturbations and design orbits for missions;
    - Plan and develop a space mission from analysis and design to implementation. They are able to define mission constraints and use these as the basis for designing and developing the necessary satellite subsystems;
    - Integrate payloads (sensors and instrumentation) in a satellite mission;
    - Implement control algorithms for satellite attitude control and orbit control within the mission constraints;
    - Plan telecommunication under different time-delay constraints and implement corresponding protocols for the remote operation of space probes from Earth;
    - Design and develop various aerospace systems (such as satellites for remote observation, landing devices for other planets, planetary rovers for surface exploration, small, pico and nano satellites); and
    - Implement aerospace engineering applications in practice for tasks in the areas of Earth observation, planetary exploration and astronomy as well as telecommunication.

Section 3 Start, Structure and Standard Length of Programme

(1) By way of derogation from Section 7 ASPO, the SaTec programme in the Elite Network of Bavaria offers winter intake only.

(2) 1The degree programme is structured as follows:

Area or sub-area	*ECTS credits*	
Mandatory electives	90	
System Analysis		20
System Design		30
System Implementation		20
Prototype Design & Implementation		20
Thesis and thesis defence	30	
Total	120	

2In the area of the mandatory electives, students must successfully complete modules with graded assessments worth a total of at least 80 ECTS credits, whereby it is irrelevant how the graded modules are distributed over the individual sub-areas; however, students must in any case earn the number of ECTS credits foreseen in the individual sub-areas.

(3) The standard length of programme for the degree in SaTec in the Elite Network of Bavaria shall be four semesters, in which students must earn a total of 120 ECTS credits.

Section 4 Prerequisites for Admission to the Programme, Recommended Fundamental Knowledge and Skills

(1) 1Admission to the SaTec programme in the Elite Network of Bavaria shall be conditional on the following prerequisites (to be met cumulatively):

a) A Bachelor's degree (180 ECTS credits) completed at JMU or another higher education institution in Germany or abroad or an equivalent German or foreign qualification (e.g. State Examination);

b) Proof of the following competences:

aa) Competences on a scale of at least 20 ECTS credits or – in the case of programmes not modularised within the meaning of the ECTS – competences on a corresponding scale in mathematics, as a rule acquired in the framework of the programme indicated under Letter a) (according to the ECTS credits scheme used at JMU for mathematics at Bachelor's level), and

bb) Competences on an overall scale of at least a further 60 ECTS credits or – in the case of programmes not modularised within the meaning of the ECTS – competences on a corresponding scale in the natural sciences (e.g. physics, astronomy, chemistry) and/or the structural and engineering sciences (e.g. mechanical engineering, electrical engineering, mathematics, computer science, aerospace engineering).

The required competences are taught at JMU for example in the framework of the following programmes: Mathematics, Computational Mathematics, Mathematical Physics, Computer Science, Physics, and Aerospace Information Technology, which lead to the Bachelor of Science degree (180 ECTS credits);

c) Suitable proof of English language proficiency at least to Level B2 of the Common European Framework of Reference for Languages (CEFR), for example:

aa) Test of English as a Foreign Language (TOEFL) with at least 72 points (internet-based TOEFL test) or

bb) International English Language Test System (IELTS) with a result of 6.0 or higher or

cc) Cambridge First Certificate in English (FCE) or

dd) A grade in English of at least 'Satisfactory' (*befriedigend*; equivalent to at least 7 out of 15 points) as part of a German higher education entrance qualification

or

A foreign higher education entrance qualification with proof of English language proficiency which is at least equivalent to the above-mentioned higher education entrance qualification or

ee) Proof that training (in particular in the framework of the first degree indicated under a)) has been completed which demanded English language skills on the level specified in aa) to dd); and

d) Proof of aptitude for the SaTec programme in the Elite Network of Bavaria furnished in the framework of an aptitude assessment procedure (cf. Appendix 'Aptitude Assessment Procedure').

2The aptitude assessment panel shall decide whether the requirements set out in Sentence 1 Letter a), the required minimum subject-specific competences (Sentence 1 Letter b)) and the language skills (Sentence 1 Letter c)) are met (cf. Appendix 'Aptitude Assessment Procedure'). 3When deciding on the equivalence of first degrees with the above-mentioned reference qualification as well as for verifying the required minimum competences and their scale (in particular in the case of non-modularised programmes), the principle of reverse burden of proof and the obligation to establish equivalence shall apply in accordance with Article 63 *Bayerisches Hochschulgesetz* (Bavarian Higher Education Act, BayHSchG), insofar as there are no significant differences with regard to the competences acquired (learning outcomes).

(2) 1In the case that the requirements set out in Subsection 1 Sentence 1 Letter a) and/or b) and/or c) are not met, admission to the SaTec programme in the Elite Network of Bavaria shall not be possible, unless admission to the Master's programme is possible in accordance with Subsection 4. 2In this case, applicants shall receive corresponding notification stating the reasons for the decision and instructions on the available legal remedies.

(3) 1If the requirements set out in Subsection 1 Sentence 1 Letter a), b) and c) are met, the applicant shall be admitted to the aptitude assessment procedure (cf. Appendix 'Aptitude Assessment Procedure'). 2Applicants who complete the aptitude assessment procedure successfully shall be entitled to commence the SaTec programme in the Elite Network of Bavaria at JMU, as long as the requirements for this programme do not substantially change. 3Applicants who do not complete the aptitude assessment procedure successfully shall receive notification stating the reasons for the decision and instructions on the available legal remedies. 4Applicants shall be offered one opportunity to repeat the aptitude assessment procedure for the SaTec programme.

(4) 1In order to facilitate an uninterrupted transition from a first degree, in particular a Bachelor's degree, to the Master's programme, applicants who are not yet able to produce corresponding proof of the degree required in accordance with Subsection 1 Sentence 1 Letter a) at the time of application may be admitted to the Master's programme in the semester immediately following, subject to a resolutive condition as follows (all requirements are to be met cumulatively):

a) Proof at the time of application of at least 150 ECTS credits or – in the case of programmes not modularised within the meaning of the ECTS – academic achievements on a corresponding scale in the first degree required in accordance with Subsection 1 Sentence 1 Letter a);

b) Proof of competences acquired by the time of application from modules in the areas required under Subsection 1 Sentence 1 Letter b) on the respective minimum scale specified or – in the case of programmes not modularised within the meaning of the ECTS – competences on the corresponding scale;

c) Proof of language skills at the time of application as specified in Subsection 1 Sentence 1 Letter c); and

d) Proof of aptitude for the SaTec programme in the Elite Network of Bavaria furnished in the framework of an aptitude assessment procedure (cf. Appendix 'Aptitude Assessment Procedure').

[2]In the event that the resolutive condition takes effect, i.e. that proof of the first degree specified in Subsection 1 Sentence 1 Letter a) is not produced at the latest by the end of the re-enrolment period for the second subject semester in the SaTec programme in the Elite Network of Bavaria, the applicant must be disenrolled at the end of the first subject semester.

(5) [1]Applicants who have not obtained their higher education entrance qualification or a relevant first degree at a German-speaking institution must additionally provide proof of sufficient proficiency in the German language. [2]This proof must be provided in line with the specifications of the Enrolment Regulations (*Immatrikulationssatzung*) of JMU as amended from time to time. [3]For the SaTec programme in the Elite Network of Bavaria, proof of basic knowledge of the German language at Level A2 of the Common European Framework of Reference for Languages (CEFR) must be produced at the latest by the end of the first year of study, in accordance with Section 4 Subsection 2 Sentence 4 of the Enrolment Regulations.

Section 5 Minimum ECTS Score Requirement

These FSB do not prescribe a minimum ECTS score requirement as described in Section 13 Subsection 5 ASPO.

Section 6 Examination Committee

[1]By way of derogation from Section 14 Subsection 1 Sentence 3 ASPO, the examination committee for the SaTec programme shall have five members. [2]The committee may bring in additional members for consultation and advice, including, but not limited to, course advisors; those members shall be non-voting.

Part 2: Assessments

Section 7 Other Subject-Specific Assessments

(1) These FSB prescribe the following subject-specific assessments:

(2) Reports: [1]Reports are written assessments to be compiled in private study which should demonstrate that the examinee is able to present the contents of a course or the activities undertaken within a course (in particular a practical course or field trip) in a structured and commensurate manner. [2]Depending on the context, the term 'report' can also appear in the SFB (list of modules) as a compound term, in particular as research report, placement report, or field trip report.

(3) Presentation: In presentations, students are expected to demonstrate their ability to explore topics assigned to them and present the results of their work in oral form; in addition, students might be required to submit a written account of their work or present their findings using a form of media (e.g. animation, video, poster, handout).

(4) Discussion: In a discussion, examinees are expected to demonstrate that they are capable of exploring the scientific topic assigned to them in a dialogue between two or more persons and of presenting sound arguments to substantiate their position.

(5) [1]Seminar papers: Seminar papers are term papers to be compiled in the framework of a seminar. [2]The provisions of Section 23 ASPO that govern term papers shall apply mutatis mutandis.

Section 8 Area of Degree Finalisation: Master's Thesis and Thesis Defence

(1) [1]The Master's thesis shall be worth 25 ECTS credits. [2]The time allowed for completion of the thesis shall be six months. [3]The topic of the Master's thesis may not be assigned until the examinee has earned at least 75 ECTS credits in the SaTec programme in the Elite Network of Bavaria.

(2) Examinees must defend their thesis in the framework of a thesis defence in accordance with the SFB.

Section 9 Overall Grade, Grade in Degree Subject and Grades Awarded for Individual Areas

[1]A student's overall grade shall be calculated in accordance with the provisions of Section 35 Subsection 1 ASPO. [2]The grade for the subject SaTec shall be calculated in accordance with Section 35 Subsection 2 ASPO, the grades for the respective areas shall be calculated in accordance with Section 35 Subsection 3 to 5 ASPO. [3]The basket model described in Section 35 Subsection 5 Sentences 7 to 9 ASPO shall be used for the calculation of the grade awarded for the area of mandatory electives. [4]The grade to be awarded for the area of mandatory electives shall be calculated on the basis of the best modules with graded assessments worth a total of 80 ECTS credits.

[5]When calculating the grade for the degree subject and the overall grade, the individual areas shall be assigned the following weight values:

<table>
<tr><th rowspan="2">Area or sub-area</th><th colspan="2" rowspan="2">ECTS credits</th><th colspan="2">Weight value for</th></tr>
<tr><th>Grade in degree subject</th><th>Overall grade</th></tr>
<tr><td>Mandatory electives</td><td>90</td><td></td><td rowspan="5">90/130</td><td rowspan="6">120/120</td></tr>
<tr><td>System Analysis</td><td></td><td>20</td></tr>
<tr><td>System Design</td><td></td><td>30</td></tr>
<tr><td>System Implementation</td><td></td><td>20</td></tr>
<tr><td>Prototype Design & Implementation</td><td></td><td>20</td></tr>
<tr><td>Thesis and thesis defence</td><td>30</td><td></td><td>40/130</td></tr>
<tr><td>Total</td><td>120</td><td></td><td></td></tr>
</table>

[6]The Faculty of Mathematics and Computer Science shall award graduates who have achieved the overall grade of 1.0 in accordance with Section 35 Subsection 1 ASPO a special certificate in recognition of their outstanding achievements in the SaTec programme in the Elite Network of Bavaria ('elite certificate'). [7]The examination committee shall decide on the exact specifications regarding the certificate as well as the framework in which it is awarded (e.g. a graduation ceremony).

Part 3: Final Provisions

Section 10 Entry into Force

[1]These FSB shall enter into force on 1 May 2018. [2]They shall apply to all students enrolled in the elite programme in Satellite Technology in the Elite Network of Bavaria (ENB) that leads to the award of the degree of Master of Science (120 ECTS credits) who commence studies in that programme at JMU in the winter semester 2018/2019 or later and whose programmes are governed by the ASPO (General Academic and Examination Regulations) for the Bachelor's and Master's Degree Programmes at Julius-Maximilians-Universität Würzburg dated 1 July 2015 as amended from time to time.

Appendix Aptitude Assessment Procedure

[1]Admission to the Master's programme shall be conditional on passing the aptitude assessment procedure. [2]This shall be conducted as described below.

Section 1 Purpose of the Aptitude Assessment Procedure

[1]The purpose of the aptitude assessment procedure is to gauge, on the basis of

1. educational background, in particular the academic achievements leading to the first degree, and
2. subject-related and methodical skills in the areas indicated in Section 4 Subsection 1 Sentence 1 Letter b) FSB,

who is qualified for the Master's degree programme. [2]The aim is to determine whether the applicant meets the very high requirements of the Master's programme in Satellite Technology (hereafter: SaTec) in the Elite Network of Bavaria and will be capable of conducting scientific work independently, in particular with regard to interdisciplinary work within research and development projects. [3]Qualifying for the SaTec programme in the Elite Network of Bavaria presupposes the applicant's aptitude according to the following rules.

Section 2 Aptitude Assessment Procedure

(1) [1]The aptitude assessment procedure shall be conducted by the aptitude assessment panel of the SaTec programme in the Elite Network of Bavaria at the Institute of Computer Science of the Faculty of Mathematics and Computer Science of JMU. [2]Where possible and within the possibilities of the personnel resources available, the aptitude assessment procedure for the winter semester shall be conducted both in the preceding spring (spring date) as well as the preceding summer (summer date), however, at least on one of these two dates in order in particular to be able to give international applicants a prompt response regarding their aptitude for the programme, whereby each date counts as an attempt with regard to the number of repetitions (Section 6 Subsection 1 Sentence 8 ASPO in conjunction with Section 4 Subsection 3 Sentence 4 FSB).

(2) [1]For both the spring and summer dates, applications for admission to the SaTec programme in the Elite Network of Bavaria for the following winter semester must be submitted by 15 March to the chairperson of the aptitude assessment panel (cf. Section 3) for the SaTec programme in the Elite Network of Bavaria in the form and by the closing date (preclusive period) specified; in particular, an electronic application procedure via the relevant JMU websites may be foreseen here. [2]Should there be reasons beyond the applicant's control, the documents referred to in Subsection 3, No. 1, Letter a) may be submitted later for both the spring and the summer date and by 31 August (preclusive period) by the latest (for the following winter semester) in order to be granted final admission to the SaTec programme in the Elite Network of Bavaria. [3]In the event that the applicant cannot meet the closing date (e.g. because the Bachelor's degree certificate has not yet been issued), the only remaining option shall be admission subject to a resolutive condition in accordance with Section 4 Subsection 4 FSB. [4]For applications for the 2018/2019 winter semester, Sentence 1 shall apply, with the additional proviso that applications for admission to the SaTec programme in the Elite Network of Bavaria can be submitted up until 15 July 2018.

(3) Applications must include:

1. Academic achievements from the first degree as specified in Section 4 Subsection 1 Sentence 1 Letter a) FSB,

    a) Proof of a university degree or an equivalent qualification (in the case of applications for final admission to the Master's programme); or

b) Proof of 150 ECTS credits or – in the case of programmes not modularised within the meaning of the ECTS – academic achievements on a corresponding scale (in the case of applications for admission to the Master's programme subject to a resolutive condition);

2. A transcript of records (overview of study and examination achievements) detailing the modules passed in the areas indicated in Section 4 Subsection 1 Sentence 1 Letter b) FSB and the examination achievements attributed to them, including the ECTS credits and grades awarded or – in the case of programmes not modularised within the meaning of the ECTS – academic achievements on a corresponding scale and, if applicable, accredited examination achievements or, in the case of applications for admission to the Master's programme subject to a resolutive condition, a provisional overview of study and examination achievements with the details referred to above. It must above all be clear from the transcript that the applicant has acquired the competences required for the SaTec programme in the Elite Network of Bavaria in accordance with Section 4 Subsection 1 Sentence 1 Letter b) FSB (in the case of an application for final admission to Master's programme) or Section 4 Subsection 4 Sentence 1 Letter b) FSB in the case of an application for admission to the Master's programme subject to a resolutive condition; and

3. Proof that the applicant possesses English language skills in accordance with Section 4 Subsection 1 Sentence 1 Letter c) FSB.

Section 3 Aptitude Assessment Panel

[1]The aptitude assessment procedure shall be conducted by an aptitude assessment panel comprising five members. [2]The chairperson of the examination committee for the SaTec programme shall be a member of the aptitude assessment panel ex officio and shall also preside over it. [3]The remaining members of the aptitude assessment panel shall be appointed by the Faculty Board of the Faculty of Mathematics and Computer Science for a period of three years; reappointment shall be permitted. [4]Only such persons may be appointed as members of the aptitude assessment panel who are authorised to administer university examinations (Article 62 *Bayerisches Hochschulgesetz* (Bavarian Higher Education Act, BayHSchG) in conjunction with the *Hochschulprüferverordnung* (Directive on Higher Education Examiners, HSchPrüferV) as amended from time to time). [5]The members of the aptitude assessment panel shall elect a deputy chairperson from among their ranks by way of simple majority. [6]The aptitude assessment panel is quorate if its members have been summoned with due notice of three days and the majority of the members are present. [7]In the case of elections and other decisions (especially within the aptitude assessment procedure), the panel shall decide by simple majority vote. [8]In the event of a tied vote, the chairperson shall have the casting vote. [9]In the performance of its duties, the panel may call on other persons authorised to administer university examinations.

Section 4 Admission to the Aptitude Assessment Procedure, Scale and Content of the Aptitude Assessment Procedure, Establishment and Announcement of the Result, Minutes

(1) Participation in the aptitude assessment procedure presupposes, in addition to the fulfilment of the requirements in accordance with Section 4 FSB, that the documents indicated in Section 2 Subsection 3 have been submitted in full and by the due date.

(2) The aptitude assessment procedure is a single-step process: [1]Applicants must demonstrate their aptitude for the subject in question within an aptitude test in the shape of a personal oral examination comprising several parts (hereafter: selection interview) in English lasting a total of about 30 minutes per examinee. [2]Examinees shall be invited by JMU in good time and at least fourteen days before the date of the interview. [3]Selection interviews with the individual applicants shall be conducted by at least two examiners, who shall be nominated by the aptitude assessment panel. [4]Entitled to act as examiners are both the members of the aptitude assessment panel themselves and persons engaged in teaching who are in charge of courses within the SaTec programme in the Elite Network of

Bavaria and authorised to administer university examinations in accordance with the HSchPrüferV. [5]Travel costs shall not be reimbursed. [6]Minutes of the main topics of the interview must be kept and signed by the examiners. [7]The date and place of the selection interview, the examiners' names, the examinee's name and the result of the interview must also be recorded in the minutes. [8]In the selection interview, examinees must give a 10-minute presentation on a scientific project or placement in which they were or are personally involved. [9]For example, the topic of the thesis of the first degree can be chosen as the subject for the presentation. [10]The presentation shall be followed by a question-and-answer session lasting about 10 minutes. [11]The selection interview shall end with a general discussion lasting about 10 minutes. [12]After the end of the interview, the examiners shall assess the respective applicant's aptitude for the SaTec programme in the Elite Network of Bavaria. [13]The following evaluation criteria shall be used to reach decisions:

	Criteria	
Presentation	Rhetorical and scientific articulateness	1 to 10 points each; the mark for the **presentation** block is the sum of all points divided by the number of criteria (the average grade is calculated to one digit after the decimal point; all other digits are deleted without rounding). Free-text remarks can be used for raising or lowering the mark.
	Introduction (presentation, didactics, design)	
	Results (presentation, didactics, design)	
	Quality of the experiments (controls, standards, statistics)	
	Critical reflection (interpretation / over-interpretation)	
	Summary (presentation, didactics, design)	
	Adherence to the time limit of 10 minutes	
Remarks		
Discussion	Willingness to engage in discussion	1 to 10 points each; the mark for the **discussion** block is the sum of all points divided by the number of criteria (the average grade is calculated to one digit after the decimal point; all other digits are deleted without rounding). Free-text remarks can be used for raising or lowering the mark.
	Ability to grasp question content	
	Convincing answers	
	Positioning of own work in the scientific context	
	Ability to answer critical questions	
Remarks		
Interview	Accurate appraisal/knowledge of the respective professional field	1 to 10 points each; the mark for the

	Knowledge of current developments in space sciences, aerospace engineering, and robotics	**interview** block is the sum of all points divided by the number of criteria (the average grade is calculated to one digit after the decimal point; all other digits are deleted without rounding). Free-text remarks can be used for raising or lowering the mark.
	General knowledge	
	Communication skills	
Remarks		

14The average scores in the three areas listed above shall then be added together. 15The selection interview shall be considered to have been passed if the applicant achieves 24.0 points or more and aptitude for the SaTec programme in the Elite Network of Bavaria considered to have been established if both examiners arrive at this conclusion. 16Applicants achieving less than 24.0 points shall be rejected on the grounds of insufficient aptitude.

(3) 1Applicants shall be notified in writing of the result of the aptitude assessment procedure; if aptitude has been established, applicants must present the respective notification at the time of enrolment. 2Rejections must be justified and include information on available legal remedies.

Julius-Maximilians-
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Annex SFB

Studienfachbeschreibung (subject description, SFB) for the subject Satellite Technology as a Master's with 1 major with the Degree (120 ECTS credits)

Responsible: Institute of Computer Science

Examination regulations version: 2018

Abbreviations used:

Course types: **E** = field trip, **K** = colloquium, **O** = conversatorium, **P** = placement/lab course, **R** = project, **S** = seminar, **T** = tutorial, **Ü** = exercise, **V** = lecture

Term: **SS** = summer semester, **WS** = winter semester

Methods of grading: **NUM** = numerical grade, **B/NB** = (not) successfully completed

Regulations: **(L)ASPO** = general academic and examination regulations (for teaching-degree programmes), **FSB** = subject-specific provisions, **SFB** = list of modules

Other: **A** = thesis, **LV** = course(s), **PL** = assessment(s), **TN** = participants, **VL** = prerequisite(s)

Conventions for the modules in this SFB:

Unless otherwise stated, courses and assessments will be held in German, assessments will be offered every semester and modules are not creditable for bonus.

Information on assessment procedures:

Should there be the option to choose between several methods of assessment, the lecturer will agree with the module coordinator on the method of assessment to be used in the current semester by two weeks after the start of the course at the latest and will communicate this in the customary manner.

Should a module comprise more than one graded assessment, all assessments will be equally weighted, unless otherwise stated below.

Should the assessment comprise several individual assessments, successful completion of the module will require successful completion of all individual assessments.

In accordance with the general regulations governing the degree subject described in this module catalogue:

ASPO2015

associated official publications (FSB (subject-specific provisions)/SFB (list of modules)):

15-May-2018 (2018-35)

This module handbook seeks to render, as accurately as possible, the data that is of statutory relevance according to the examination regulations of the degree subject. However, only the FSB (subject-specific provisions) and SFB (list of modules) in their officially published versions shall be legally binding. In the case of doubt, the provisions on, in particular, module assessments specified in the FSB/SFB shall prevail.

Every module will be described using the following form:

Abbreviation	**Module title**							
	ECTS		Duration	(in semesters)	Method of grading		Module level	
	Courses	To be specified in the form X (y) with course type X abbreviated as specified above and number of weekly contact hours y						
	Method of assessment							
	Only after successful completion of	if applicable						
	Other prerequisites	if applicable						
	Participants and allocation of places	if applicable						
	Additional information	if applicable						
	Referred to in LPO I	if applicable (examination regulations for teaching-degree programmes)						

Compulsory Electives (90 ECTS credits)								
System Analysis (20 ECTS credits)								
10-I-SP-182-m01	**Space Physics**							
	ECTS	8	Duration	1 semester	Method of grading	numerical grade	Modul level	graduate
	Courses		V (4) + Ü (2) Module taught in: English					
	Method of assessment		written examination (approx. 90 to 120 minutes) Language of assessment: English creditable for bonus					
10-I=CE1-182-m01	**Control Engineering in Space 1**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	graduate
	Courses		V (2) + Ü (2) Module taught in: English					
	Method of assessment		written examination (approx. 90 to 120 minutes) Language of assessment: English creditable for bonus					
10-I=CS-SE1-182-m01	**Computer Science for Space Engineering**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	graduate
	Courses		V (2) + Ü (2) Module taught in: English					
	Method of assessment		written examination (approx. 90 to 120 minutes) Language of assessment: English creditable for bonus					
10-I=SSA-182-m01	**Spacecraft System Analysis**							
	ECTS	10	Duration	1 semester	Method of grading	numerical grade	Modul level	graduate
	Courses		V (4) + Ü (2) + E (2) Module taught in: English					
	Method of assessment		written examination (approx. 90 to 120 minutes) and field trip report (4 to 8 pages) Language of assessment: English creditable for bonus					
10-I=SD-182-m01	**Space Dynamics**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	graduate
	Courses		V (2) + Ü (2) Module taught in: English					
	Method of assessment		written examination (approx. 90 to 120 minutes) Language of assessment: English creditable for bonus					

10-I=STSA-182-m01	**Selected Topics System Analysis**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	graduate
	Courses		V (2) + Ü (2) Module taught in: English					
	Method of assessment		a) written examination (approx. 90 to 120 minutes) orb) project (project documentation approx. 20 pages with presentation 30 to 45 minutes and subsequent discussion on the topic) or cb) oral examination of one candidate each (approx. 20 minutes) or d) oral examination in groups (groups of up to 2 candidates, approx. 15 minutes per candidate) Language of assessment: English creditable for bonus					
System Design (30 ECTS credits)								
10-I=TSD-182-m01	**DesignTelecommunication System Design**							
	ECTS	10	Duration	1 semester	Method of grading	numerical grade	Modul level	graduate
	Courses		V (4) + Ü (2) Module taught in: English					
	Method of assessment		written examination (approx. 90 to 120 minutes) Language of assessment: English creditable for bonus					
10-I=PEB-182-m01	**Performance Engineering and Benchmarking**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	graduate
	Courses		V (2) + Ü (2) Module taught in: English					
	Method of assessment		written examination (approx. 90 to 120 minutes) Language of assessment: English creditable for bonus					
10-I=RS-182-m01	**Remote Sensing**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	graduate
	Courses		V (2) + Ü (2) Module taught in: English					
	Method of assessment		written examination (approx. 90 to 120 minutes) Language of assessment: English creditable for bonus					
10-I=CE2-182-m01	**Control Engineering in Space 2**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	graduate
	Courses		V (2) + Ü (2) Module taught in: English					
	Method of assessment		written examination (approx. 90 to 120 minutes) Language of assessment: English creditable for bonus					

10-I=ASS-182-m01	**Advanced Sensory Systems and Sensor Data Processing**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	graduate
	Courses		V (2) + Ü (2) Module taught in: English					
	Method of assessment		written examination (approx. 90 to 120 minutes) Language of assessment: English creditable for bonus					
10-I=TOR-182-m01	**Trajectory Optimization and Reliability**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	graduate
	Courses		V (2) + Ü (2) Module taught in: English					
	Method of assessment		written examination (approx. 90 to 120 minutes) Language of assessment: English creditable for bonus					
10-I=P2-182-m01	**Internship**							
	ECTS	5	Duration		Method of grading	numerical grade	Modul level	graduate
	Courses		R (6) Module taught in: English					
	Method of assessment		project (project documentation (approx. 20 pages) with presentation (30 to 45 minutes) and subsequent discussion on the topic) Language of assessment: English					
10-I=STSD-182-m01	**Selected Topics System Design**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	graduate
	Courses		V (2) + Ü (2) Module taught in: English					
	Method of assessment		a) written examination (approx. 90 to 120 minutes) orb) project (project documentation approx. 20 pages with presentation 30 to 45 minutes and subsequent discussion on the topic) or cb) oral examination of one candidate each (approx. 20 minutes) or d) oral examination in groups (groups of up to 2 candidates, approx. 15 minutes per candidate) Language of assessment: English creditable for bonus					
System Implementation (20 ECTS credits)								
10-I=RO1-152-m01	**Robotics 1**							
	ECTS	8	Duration	1 semester	Method of grading	numerical grade	Modul level	graduate
	Courses		V (4) + Ü (2)					
	Method of assessment		written examination (approx. 60 to 90 minutes) creditable for bonus					

10-I=STL-182-m01	**Satellite Telecommunication Lab**							
	ECTS	6	Duration	1 semester	Method of grading	numerical grade	Modul level	graduate
	Courses		V (2) + Ü (2) + E (2) Module taught in: English					
	Method of assessment		a) written examination (approx. 90 to 120 minutes) and field trip report (4 to 8 pages) or b) oral examination of one candidate each (approx. 20 minutes) and field trip report (4 to 8 pages) or d) oral examination in groups (groups of up to 3 candidates, approx. 15 minutes per candidate) and field trip report (4 to 8 pages) Language of assessment: English					
10-I=ADP-182-m01	**Advanced On-Board Data Processing**							
	ECTS	6	Duration	1 semester	Method of grading	numerical grade	Modul level	graduate
	Courses		V (4) + Ü (2) Module taught in: English					
	Method of assessment		written examination (approx. 90 to 120 minutes) Language of assessment: English creditable for bonus					
10-M-MWR-182-m01	**Modelling and Computational Science**							
	ECTS	8	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (4) + Ü (2) Module taught in: English					
	Method of assessment		a) written examination (approx. 90 to 180 minutes, usually chosen) or b) oral examination of one candidate each (15 to 30 minutes) or c) oral examination in groups (groups of 2, 10 to 15 minutes per candidate) Language of assessment: English creditable for bonus					
10-I=RSM-182-m01	**Radar systems and missions**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	graduate
	Courses		V (2) + Ü (2) Module taught in: English					
	Method of assessment		written examination (approx. 90 to 120 minutes) Language of assessment: English creditable for bonus					
10-I=APR-182-m01	**Advanced Programming**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	graduate
	Courses		V (2) + Ü (2) Module taught in: English					
	Method of assessment		written examination (90 to 120 minutes) Language of assessment: English creditable for bonus					

10-I=SA-182-m01	**Aerospace Seminar**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	graduate
	Courses		V (2) + Ü (2) Module taught in: English					
	Method of assessment		a) written examination (90 to 120 minutes) or b) project (project documentation approx. 20 pages with presentation 30 to 45 minutes and subsequent discussion on the topic) Language of assessment: English creditable for bonus					
10-I=P1-182-m01	**Project Workshop**							
	ECTS	5	Duration		Method of grading	numerical grade	Modul level	graduate
	Courses		R (6) Module taught in: English					
	Method of assessment		project (project documentation (approx. 20 pages) with presentation (30 to 45 minutes) and subsequent discussion on the topic) Language of assessment: English					
	Additional Information		Project in industriy or university in the field rover, planetary exploration, earth observation, tele communication.					
10-I=STSI-182-m01	**Selected Topics System Implementation**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	graduate
	Courses		V (2) + Ü (2) Module taught in: English					
	Method of assessment		a) written examination (approx. 90 to 120 minutes) orb) project (project documentation approx. 20 pages with presentation 30 to 45 minutes and subsequent discussion on the topic) or cb) oral examination of one candidate each (approx. 20 minutes) or d) oral examination in groups (groups of up to 2 candidates, approx. 15 minutes per candidate) Language of assessment: English creditable for bonus					
Prototype Design & Implementation (20 ECTS credits)								
10-I=TDP-182-m01	**Team Design Project**							
	ECTS	10	Duration	1 semester	Method of grading	numerical grade	Modul level	graduate
	Courses		R (8) Module taught in: English					
	Method of assessment		project (project documentation (approx. 20 pages) with presentation (30 to 45 minutes) and subsequent discussion on the topic) Language of assessment: English					
10-I=CD-W-182-m01	**CanSat Design Lab**							
	ECTS	10	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		R (8) Module taught in: English					
	Method of assessment		practical project (development, construction and presentation of a "can sized satellite", project documentation (approx. 20 pages) with presentation (30 to 45 minutes) and subsequent discussion on the topic) Language of assessment: English					

10-I=FDW-182-m01	**FloatSat Design Lab**							
	ECTS	10	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		R (8) Module taught in: English					
	Method of assessment		practical project (development, construction and presentation of a satellite control system, project documentation (approx. 20 pages) with presentation (30 to 45 minutes) and subsequent discussion on the topic) Language of assessment: English					
10-I=ISS-182-m01	**International Summer School**							
	ECTS	5	Duration		Method of grading	numerical grade	Modul level	graduate
	Courses		R (6) Module taught in: English					
	Method of assessment		a) written examination (approx. 60 to 90 minutes) or b) project (project documentation approx. 20 pages with presentation 30 to 45 minutes and subsequent discussion on the topic) or c) oral examination of one candicate (approx. 20 minutes) or d) oral examination in groups (groups up to 3 candidates, approx. 15 minutes per candidate) Language of assessment: English					
10-I=STPDI-182-m01	**Selected Topics Prototype Desgin and Implementation**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	graduate
	Courses		V (2) + Ü (2) Module taught in: English					
	Method of assessment		a) written examination (approx. 90 to 120 minutes) orb) project (project documentation approx. 20 pages with presentation 30 to 45 minutes and subsequent discussion on the topic) or cb) oral examination of one candidate each (approx. 20 minutes) or d) oral examination in groups (groups of up to 2 candidates, approx. 15 minutes per candidate) Language of assessment: English creditable for bonus					
Thesis (30 ECTS credits)								
10-I=ThesisSat-Tec-182-m01	**Master#s Thesis SatTec Advanced Technology Systems**							
	ECTS	25	Duration		Method of grading	numerical grade	Modul level	graduate
	Courses		No courses assigned to module Module taught in: English					
	Method of assessment		Master's thesis (50 to 100 pages) Language of assessment: English					
10-I=DefSat-Tec-182-m01	**Oral Examination Space Science and Technology**							
	ECTS	5	Duration	1 semester	Method of grading	(not) successfully completed	Modul level	graduate
	Courses		K (0)					
	Method of assessment		final colloquium (approx. 60 minutes) comprising: talk on thesis (45 minutes) and subsequent defence of thesis (15 minutes) Language of assessment: English					